International Journal of Science, Environment and Technology, Vol. 9, No 4, 2020, 581 – 585
ISSN 2278-3687 (O)
2277-663X (P)

RE INFECTION OF CANINE EHRLICHIOSIS AND ITS SUCCESSFUL THERAPEUTIC MANAGEMENT IN A MALE PUG DOG

L. Narayana Rao[1*], N. Lakshmi Rani[2], Laimi Elizabeth S[3] and K. Rajesh[4]
[1]Assistant Professor (Veterinary Medicine) Contractual; [4]Assistant Professor (Veterinary Medicine) Department of Veterinary Clinical Complex, NTR CVSc, Gannavaram -521 102.
[2]Professor & Head; [3]Assistant Professor (Contractual); Department of Veterinary Medicine, NTR CVSc, Gannavaram -521 102.
E-mail: lnrao402@gmail.com (**Corresponding author*)

Abstract: Two years old male pug was presented to the hospital with history of tick infestation, anorexia, melena, and exercise intolerance. Clinical examination revealed the pale mucous membranes, pyrexia, lymphadenopathy, respiratory distress Splenomegaly and hepatomegaly. Haemato- biochemical examination revealed anemia leukocytosis and thrombocytopenia, hypoproteinemia hypoalbuminemia, and elevated globulin, ALT, ALP, BUN and creatinine. Upon microscopic examination of peripheral blood and buffy coat smear *E. Canis* morulae were identified and confirmatory diagnosis was done by nested PCR. Dog was treated with doxycycline @10mg/kg b.wt p/o for 28days and complete recovery and absence of parasitic evidence on buffy coat smear and nested PCR observed after successful therapy. The same dog was presented hospital after four and half months of treatment with previous clinical signs, case was diagnosed, treated successfully and advised eradicate the ticks completely.
Keywords: Canine ehrlichiosis; Doxycycline; Recurrence; Thrombocytopenia.

INTRODUCTION

Canine ehrlichiosis is a multi-systemic, transmissible, infectious disease of dogs caused by the *Ehrlichia canis* and transmitted by brown dog tick *Rhiphicephalus sanguinus*. The disease was initially identified by Donatien and Lestoquard in Algeria in 1935 [1], and in India it was first reported in Chennai by Mudaliar (1944) [5]. Diseases is clinically characterized by sudden onset of fever, depression, pale mucous membrane, petechial hemorrhages, epistaxis, abdominal pain, polyuria, polydipsia and stiff swollen and painful joints. Traditional diagnostic techniques including hematology, cytology, serology and isolation are valuable diagnostic tools for Canine Monocytic Ehrlichiosis (CME), however a definitive diagnosis of *E .canis* infection requires molecular technique. Once diagnosis was confirmed a prolonged therapeutic management is require for recovery.

CASE HISTORY AND DIAGNOSIS

Two years old male pug was presented to the small animal medicine ward, VCC, NTR College of Veterinary Science, Gannavaram, with the history of tick infestation, anorexia,

*Received June 13, 2020 * Published Aug 2, 2020 * www.ijset.net*

melena, and exercise intolerance. Clinical examination revealed pale mucous membranes, pyrexia, lymphadenopathy and respiratory distress. Radiography and abdominal ultrasonography revealed Splenomegaly, hepatomegaly and interstitial lung pattern. The blood sample was collected in EDTA vial and clot activator for routine Heamato-biochemical analysis and it revealed anemia, leukocytosis and thrombocytopenia, decreased levels of total serum protein, albumin and elevated AL T , ALP, BUN and creatinine. Microscopic examination of peripheral blood and buffy coat smear were positive for *E. canis* morulae in monocyte (Fig.1). Further confirmatory diagnosis was done by nested PCR by amplifying *E.canis* a 477 bp (Fig.2) and 387 bp (Fig.3) and condition was diagnosed as canine ehrlichiosis.

Table 1: Pre and post-treatment Hemato biochemical findings in canine ehrlichiosis

Parameter	Before treatment	After treatment		Reference values*
	0th day	15th day	30th day	
Hb (g/dl)	5.4	7.2	9.0	12-19
HCT (%)	17	21	29	35-57
TEC($\times 10^6$ / µl)	2.56	3.53	4.54	5-7.9
TLC($\times 10^3$ /µl)	15.7	16	9.49	5-14 .1
Neutrophil (%)	78.0	76.0	76.0	58-85
Eosinophil (%)	1	2	0	0-9
Basophil (%)	0	0	0	0-1
Monocytes (%)	4.0	4.0	4.0	2-10
Lymphocytes (%)	17.0	19.0	20.0	8-21
Platelets (10^3/µl))	56	220	300	211-621
MCV	68.8	60.1	64.0	66-77
MCH	21.0	20.0	21.0	21-26.2
MCHC	30.6	33.4	33.0	32-36.3
Total protein (g/dl)	4.6	5.2	6.1	5.4-7.5
Albumin (g/dl)	1.6	2.3	2.7	2.3-3.1
Globulin (g/dl)	3	2.9	3.4	2.4-4.4
ALT or SGPT (IU/L)	164	228	54	10-109
ALP (IU/L)	228	240	24	1-114
BUN (mg/dl)	34.0	30.0	25.0	8-28
Serum creatinine (mg/dL)	1.9	1.5	1.0	0.5-1.7

* **Reference ranges, 10th edition The Merck Veterinary Manual.**

TREATMENT AND DISCUSSION

Treatment was initiated using doxycycline (Doxypet @10mg/kg b.wt once in a day per orally for 28 days) and other supportive treatment includes antacid (Pantaprazole @mg/kg per orally for 28 days), hepato- protectant (Ventriliv – pet), hematinic (fefolate), platelet enhancer (Platogrow) @ 6ml / day each orally . The owner way further advised to use Fipronil spot-on and 1.0% cypermethrin shampoos. Dog started clinical improvement on 5th day of post treatment which showed complete clinical recovery with normal appetite and improvement in general condition by 30days. The pre and post therapeutic (15&30days) haematological and serum biochemical values are presented in table 1. Laboratory recovery way also confirmed by examination buffy coat and nested PCR which revealed no parasites.

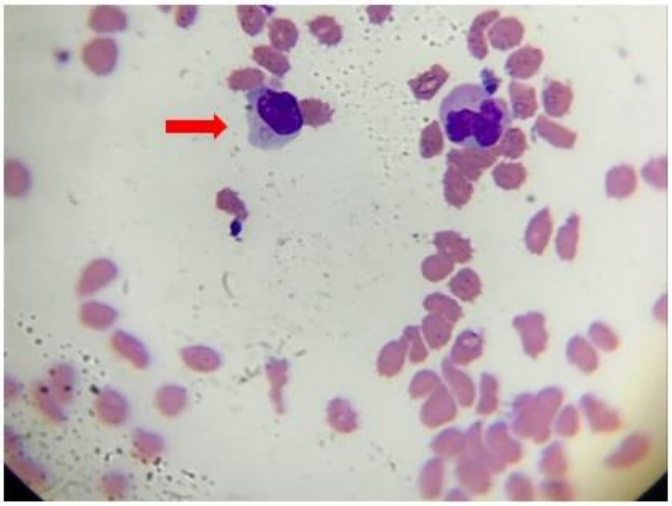
The same dog was presented to hospital with previous clinical signs after four and half months. Detailed history revealed that dog was re exposed to the infected ticks from the surroundings, which results in re infection. Based on microscopic examination and nested PCR results the diseases was confirmed as reinfection of canine ehrlichiosis. Therapy was repeated for one month and advised to eradicate ticks from premises and housing the animal away from infected premises to break down the life cycle of ticks.

Canine ehrlichiosis in dogs is caused primarily by *E. canis* and transmitted by *Rhipicephalus sanguinus* ticks [4]. It causes a potentially fatal disease in dogs that requires rapid and accurate diagnosis in order to initiate appropriate therapy leading to a favourable prognosis. Splenomegaly, hepatomegaly is the major internal organ changes observed in abdominal ultrasonography these findings was parallel with Sarma *et al*.(2014) [7], Hepatomegaly could be probable, due to passive congestion, reticulo endothelial hyperplasia or infiltrative diseases mediated through cytokines and Splenomegaly was because of reactive lymphoid hyperplasia and concurrent extramedilary hematopoiesis [2]. Harrus *et al.* (1997) [3] opined that Splenomegaly might be due to harboring *E. canis* parasites by spleen and is the last organ to accommodate the parasite before elimination. Anemic changes could be due to epistaxis, petechial hemorrhages and bone marrow hypoplasia and thrombocytopenia occurs due to increased platelet consumption and decreased platelet half-life. Recurrence of infection might be due to reinfection of infected ticks from surroundings. These findings were in according with Stephen Dumler *et al*. (1992) [8]. Perill *et al.* (1991) [6] observed persistently increased antibody titers in ehrlichia effected dogs after initiation of 15 to 31 months treatment.

CONCLUSION

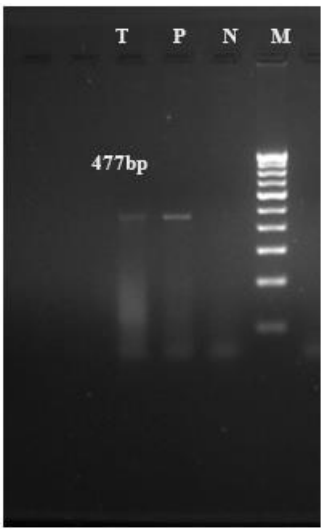
Reinfection of canine ehrlichiosis is possible because no persistent or effective immunity develops to defined against re-infection with these pathogen. When no proper ticks control measures are employed and dogs are re-exposed, re infection is common.

Fig.1 *Ehrlichia canis* in buffy coat smear



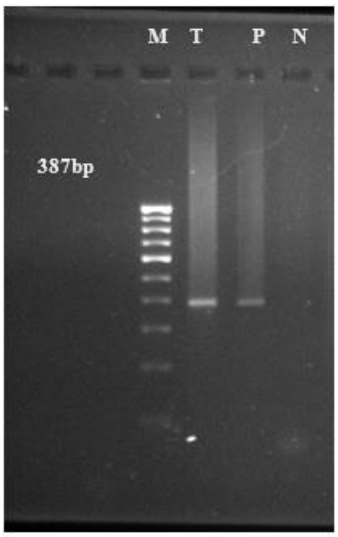
Purple colored inclusion bodies with in the cytoplasm of monocyte suggestive of *E.canis* morula, Giemsa stain X 1000.

Fig.2 *Ehrlichia* sp-Genus specific Nested PCR



M-100bp ladder P-known positive control of Ehrlichia sp, N-known negative control, T-Positive sample of *Ehrlichia* sp

Fig.3 *Ehrlichia canis*-Species specific Nested PCR



M-100bp ladder P-known positive control of *E.canis* N-known negative control, T-Positive sample of *E.canis*

REFERENCES

[1] Donatien, A. and Lestoquard, F. (1936). Rickettsia bovisnouvelle especepathogene pour le boeuf. Bull. Soc. Pathol. Exot. **29**: 1057–1061

[2] Egenvall, A., Lilliehöök, I., Karlstam, E., Bjöersdorff, A., Engvall, E. O., Artursson, K.and Gunnarsson, A. (2000). Detection of granulocytic Ehrlichia species DNA by PCR in persistently infected dogs. Veterinary Record. **146(7):** 186-190.

[3] Harrus, S., Kass, P.H., Klement, E. and Waner, T. (1997). Canine monocytic ehrlichiosis: a retrospective study of 100 cases and an epidemiological investigation of prognostic indicators for the disease. The Veterinary Record. **141 (14)**:360.

[4] Inokuma, H, Ohno K, Onishi, T., Raoult, D. and Brouqui P. (2001). Detection of Ehrlichia infection by PCR in dogs from Yamaguchi and Okinawa Prefectures, Japan. Journal of Veterinary Medical Science. **63 (7)**: 815-817.

[5] Mudaliar, S. V. (19440. Canine Rickettsiosis ins. India. Preliminary Note. Indian Veterinary Journal. **20**:16-164.

[6] Perille, A. L., and Matus, R.E. (1991). Canine ehrlichiosis in six dogs with persistently increased antibody titers. *Journal of Veterinary Internal Medicine*, **5(3):** 195-198.

[7] Sarma, K., Mondal, D.B. and Saravanan, M. (2014). Ultrasonographic changes in dogs naturally infected with tick borne intracellular diseases. Journal of Parasitic Diseases. **40 (2)**: 248-251.

[8] Stephen Dumler, J., William, L. Sutker. And David, H. (1992). Walker Persistent Infection with Ehrlichia chaffeensis. Clinical Infectious Diseases .**17:** 903-5